

Intolerance of Uncertainty, Perceived Control, and Pathological Worry: Mediating Role of Experiential Avoidance

Hye-rim Hong Bo Young Choi[†]

Department of Education, Graduate School of Education, Jeju National University, Jeju, Korea

This study aims to examine whether intolerance of uncertainty and perceived control are indirectly associated with pathological worry through experiential avoidance. A total of 406 adults (aged 19–29 years) across South Korea completed questionnaires assessing intolerance of uncertainty (IUS-12), perceived control (K-ACQ), experiential avoidance (AAQ-16), and pathological worry (K-PSWQ). Findings showed that the competing model was more appropriate than the research model. In the competing model, the relation between intolerance of uncertainty and pathological worry was partly accounted for by experiential avoidance, whereas the relation between perceived control and pathological worry was accounted for through experiential avoidance. Subsequent path analysis controlling for gender indicated that the direct path from experiential avoidance to pathological worry had a larger standardized coefficient than the direct path from intolerance of uncertainty to pathological worry. These findings underscore the relevance of intolerance of uncertainty and experiential avoidance to pathological worry, as emphasized in the Intolerance of Uncertainty Model and the Acceptance-Based Model, respectively. They also point to the potential utility of acceptance-based behavioral interventions for pathological worry. The implications and limitations of the study are discussed.

Keywords: generalized anxiety disorder, intolerance of uncertainty, perceived control, experiential avoidance, pathological worry

Introduction

Generalized anxiety disorder (GAD) is a psychological disorder characterized by uncontrollable worry and intense anxiety about

various events (APA, 2013). Of these, uncontrolled worry is a key factor in diagnosing GAD (APA, 2003), it was thus necessary to clarify the defining characteristics of worry while developing the GAD model (Dugas et al., 2005). However, recurrent worry is a common cognitive activity experienced by several individuals, and severe worry is a contributing factor to anxiety in other anxiety disorders (Borkovec, 1994). Because of this complexity of worry, theoretical models of GAD have been slow to develop (Turk & Wolanin, 2006). Furthermore, GAD has faced much criticism concerning its diagnostic reliability. Several studies have reported that GAD in the Diagnostic and Statistical Manual of Mental Disorders, Third Edition, Revised (DSM-III-R) was found to have low diagnostic reliability (Mannuzza et al., 1989; Di Nardo et al., 1993, as cited in Brown et al., 2001).

Despite the difficulty in diagnosing GAD, epidemiologic re-

[†]Correspondence to Bo Young Choi, Department of Education, Graduate School of Education, Jeju National University, 102 Jejudaehak-ro Jeju, Jeju 63243, Korea; E-mail: bychoi@jejunu.ac.kr

Received Nov 23, 2025; Revised Apr 20, 2026; Accepted Apr 29, 2026

This article is based on a master's thesis submitted to Jeju National University in 2025 and has been revised and expanded for publication.

The authors declare that they have no conflict of interest.

This research received no external funding.

The study was conducted in accordance with the Declaration of Helsinki and was approved by the Institutional Review Board of Jeju National University (Approval No. JJNU-IRB-2024-055-001).

Informed consent was obtained from all participants included in this study.

This study was not pre-registered.



© 2026, Korean Journal of Clinical Psychology. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

search has shown that it has an earlier onset and a more gradual course than panic disorder (Rapee, 1985). The National Comorbidity Study found that the current prevalence of GAD (past six months) was 1.6% of the total sample, the 1-year prevalence was 3.1% of the total sample, and the lifetime prevalence was 5.1% (Wittchen et al., 1994). Another difficulty is that pathological worry may be perceived by individuals as a personality trait (Rapee, 1991), which increases their likelihood of relying on alternative treatments (e.g., acupuncture or hypnosis) rather than seeking professional medical help (Rapee, 1985). This can delay the timing of intervention (Rapee, 1991). Therefore, to develop effective prevention and intervention measures, it is necessary to elucidate the mechanisms underlying pathological worry symptoms that affect quality of life.

The Intolerance of Uncertainty Model (IUM; Dugas et al., 1998) posits that intolerance of uncertainty (IU) is central to worry and anxiety in GAD (Dugas et al., 1998). Among the variables proposed within this model—positive beliefs about worry, cognitive avoidance, negative problem orientation, and IU—IU has been reported to be the only variable uniquely associated with GAD, relative to panic disorder (Dugas et al., 2005). Given that individuals with GAD show higher levels of pathological worry than other anxiety disorder groups and nonclinical groups (Ladouceur et al., 1999), IU may be closely associated with pathological worry. Here, IU refers to perceiving and processing information in ambiguous situations and events based on the belief that uncertainty is unacceptable (Ladouceur et al., 1998) and responding in three domains—cognitive, affective, and behavioral—based on the gathered information (Freeston et al., 1994). Individuals with low tolerance for uncertainty tend to focus on problems that have not yet occurred (Freeston et al., 1994), a pattern that may be accompanied by heightened internal questioning. Moreover, such internal questioning, such as “What if ...?”, may persist even in the absence of an immediate external stimulus (Dugas et al., 1998). This pattern may also be related to beliefs that worrying is helpful for coping with fear-provoking events or preventing them from occurring (Borkovec, 1994). In this way, a continued search for evidence to respond to such worries may be associated with more persistent and difficult-to-control worry (Behar et al., 2009; Freeston et al., 1994).

In a previous study using hierarchical regression analysis, intoler-

ance of uncertainty was found to account for an additional 5% of the variance in pathological worry even after controlling for gender (16% of the variance explained) and for anxiety and depression (an additional 36% of the variance explained) (Buhr & Dugas, 2002). Other studies have likewise reported a positive association between intolerance of uncertainty and pathological worry (Gvozden et al., 2021; Shin & Kim, 2021; Yang & Park, 2014). Based on these findings, the present study proceeded under the assumption that intolerance of uncertainty would be positively associated with pathological worry.

Perceived control refers to the belief that in uncertain events and situations, an individual has autonomy to determine their internal states and behaviors, that they can influence their environment, and that they may obtain desired outcomes (Wallston et al., 1987). A lack of perceived control over early life events can promote instability in psychological structures, leading to anxiety (Chorpita & Barlow, 1998). Furthermore, experiences of perceived control, especially in early life events, are not limited to simply knowing whether one has control (Flammer, 1995). Rather, such experiences contribute to forming beliefs that corresponding outcomes are possible under similar conditions in the future (Flammer, 1995). Consistent with this account, previous studies have reported that perceived control is negatively associated with pathological worry (Shin & Kim, 2021; Cho & Jo, 2014). Accordingly, the present study was conducted under the assumption that perceived control would be negatively associated with pathological worry. Therefore, in ambiguous situations, beliefs shaped by early life experiences may be associated with lower perceived control, heightened anxiety, and more uncontrollable worry.

The Acceptance-Based Model of GAD (ABM; Roemer & Orsillo, 2002, 2005) viewed experiential avoidance as a central variable in the perpetuation of GAD-related processes and therefore considered it an appropriate target for intervention. When individuals attempt to avoid private experiences in ambiguous situations, this has been described as occurring when external events are perceived as threatening or when unpleasant internal experiences arise (Behar et al., 2009). Here, experiential avoidance refers to the phenomenon in which one attempts to regulate the frequency, context, or form of striking private experiences induced by uncertain situations (e.g., emotions, thoughts, memories, and bodily

sensations) without directly confronting them (Hayes et al., 1996). Experiential avoidance has been described as temporarily alleviating distress caused by internal experiences, while also being associated with reduced engagement in valued behaviors and greater distress over time (Behar et al., 2009). Previous research has also reported a positive association between experiential avoidance and pathological worry (Yang & Park, 2014). Another study also reported that experiential avoidance was positively associated with psychiatric symptoms, including anxiety, depression, negative self-somatization, and hostility (Gerdan & Salcioglu, 2025). Given that GAD is associated with high levels of pathological worry (Ladouceur et al., 1999), higher levels of experiential avoidance may also be associated with pathological worry.

Taken together, prior work suggests a process linking these variables. Intolerance of uncertainty has long been regarded as central to accounts of the development and maintenance of GAD, and more recent work has drawn attention to the role of experiential avoidance. Intolerance of uncertainty can be understood both as a cognitive style involved in responding to threat and as a vulnerability marked by difficulty tolerating ambiguity. Individuals with low tolerance for uncertainty may be more likely to perceive ambiguous situations as threatening and to experience negative internal states such as anxiety (Roemer & Orsillo, 2002, 2005; Dugas et al., 1998). Within the IUM, such individuals are thought to rely on cognitive avoidance, including worry, in response to unpleasant internal experiences, thereby maintaining a cycle of cognitive vulnerability. At the same time, a purely cognitive account may not fully explain the persistence of pathological worry. From the perspective of the ABM, individuals may respond to unpleasant private experiences including thoughts, emotions, and bodily sensations through experiential avoidance (Behar et al., 2009). This coping pattern may reduce the likelihood of adaptive problem solving and may be linked to heightened worry and anxiety (Behar et al., 2009). Consistent with this view, previous studies have reported positive relations between intolerance of uncertainty and experiential avoidance (Gerdan & Salcioglu, 2025; Yang & Park, 2014). Earlier work has also linked intolerance of uncertainty to pathological worry through cognitive, emotional, and behavioral forms of avoidance. Previous studies have shown that intolerance of uncertainty is related to pathological worry through cognitive avoid-

ance (Kim & Hyun, 2011), negative problem orientation (Cho & Jo, 2014; Seol & Oh, 2008), and experiential avoidance (Yang & Park, 2014). Accordingly, this study aims to move beyond earlier models that focused primarily on cognitive avoidance in explaining the development and maintenance of pathological worry and to clarify the role of experiential avoidance in this process.

Perceived control, by contrast, refers to a relatively stable belief that one can influence outcomes or the surrounding environment and, unlike a cognitive processing style, may shape coping depending on how one appraises one's own abilities. Individuals with low perceived control may underestimate their capacity to manage ambiguous situations because their confidence in being able to deal effectively with tension-provoking circumstances is weakened (Nam & Lee, 2005). As a result, they may be more likely to adopt a negative problem orientation, responding through avoidance rather than direct engagement with the problem (Roemer & Orsillo, 2002, 2005). Although avoiding ambiguity-related threat may temporarily reduce tension, it may also limit deeper emotional processing, restrict opportunities for corrective learning, and thereby remain implicated in the persistence of anxiety (Roemer & Orsillo, 2002, 2005; Mennin et al., 2002).

Seo (2017) reported that perceived control was negatively related to experiential avoidance, that the direct path from perceived control to social anxiety was not significant, and that internalized shame was linked to social anxiety only indirectly through perceived control and experiential avoidance. Also, previous studies have suggested that perceived control is related to pathological worry through negative problem orientation (Cho & Jo, 2014) and cognitive avoidance (Kim & Hyun, 2011). Accordingly, in the present study, lower perceived control was expected to be related to pathological worry through avoidance coping with private experiences.

Overall, the present model was specified as follows. In Korean studies on GAD-related variables, experiential avoidance has been found to mediate the relation between intolerance of uncertainty and pathological worry. By contrast, studies examining perceived control and pathological worry have focused mainly on cognitive aspects, and the role of experiential avoidance in this relation has not been sufficiently examined. To address this gap, the present study tested an integrated path model in which experiential avoid-

ance was specified as a mediator of the relations of intolerance of uncertainty and perceived control with pathological worry.

The rationale for research and competing models was as follows. The research model specified in this study included direct paths from intolerance of uncertainty and perceived control to pathological worry, along with indirect paths through experiential avoidance. The competing model was identical except that the direct path from perceived control to pathological worry was removed. The direct path from intolerance of uncertainty to pathological worry was retained because previous studies have documented a direct relation between these variables (Cho & Jo, 2014; Yang & Park, 2014), and because intolerance of uncertainty has been described as a key component of the Intolerance of Uncertainty Model (Dugas et al., 1998). The direct path from perceived control to pathological worry was removed considering findings suggesting that the direct path from perceived control to social anxiety was not significant and that internalized shame was linked to social anxiety only indirectly through perceived control and experiential avoidance (Seo, 2017). The final model was determined by comparing the fit of the two models. In addition, because previous research has reported higher levels of worry among women than among men (Shin & Kim, 2021), gender was controlled in the analyses.

- H1. The research model would provide a better fit than the competing model.
- H2. Experiential avoidance would serve as a mediator in the relationship between intolerance of uncertainty and pathological worry.
- H3. Experiential avoidance would serve as a mediator in the relationship between perceived control and pathological worry.

Methods

Participant and Procedure

This study was approved by the Institutional Review Board (IRB) of Jeju National University (Approval No. 2024-055-002), and data were collected from June 25–27, 2024, through an online research company MACROMILL EMBRAIN. After excluding 56 insincere responses, we analyzed data from 406 adults aged 19–29 years (202 females, 204 males; mean age = 25.47 years, $SD = 3.05$).

Measures

Intolerance of Uncertainty Scale, Short Form (IUS–12)

To measure responses to ambiguous future events, the short form of the IUS-12 used in this study was originally developed by Carleton et al. (2007) and was validated for use in the Korean context by Lee et al. (2023). The scale comprises 12 items and is appropriate to treat the scale as single-factor (Lee et al., 2023). Each item was rated on a 5-point Likert scale. Higher total scores indicate greater IU. The reliability of the measurement instrument was .87 in Lee et al. (2023) and .88 in this study.

Revised Korean Version of the Anxiety Control Questionnaire (K-ACQ)

To measure the level of control and emotional responses directly related to anxiety, Rapee et al. (1996) developed a 30-item scale. In this study, the revised K-ACQ, shortened to 19 items, translated, and validated by Oh and Oh (2009) was used. It was conceptualized as a unidimensional construct (Rapee et al., 1996), and the total score was used. Each item was rated on a 6-point Likert scale. Nine items were reverse-scored. A high total score reflects high perceived control. The reliability of the scale was .80 in Oh and Oh's study (2009), and the scale reliability of this study was .87.

Acceptance and Action Questionnaire–16 (AAQ–16)

To measure the degree of acceptance in the coping process, this study used the AAQ-16, developed by Hayes et al. (2004), translated and validated into Korean by Moon (2006). The scale comprises 16 items, and each item was rated on a 7-point Likert scale. Although a two-factor structure has been suggested, previous studies (Bond et al., 2007; as cited in Yang & Park, 2014) reported that the items in one factor were all positively worded, making it more appropriate to treat the scale as single-factor rather than two-factor. Eight items were reverse-scored. Because the scores were reversed, higher total scores indicate higher experiential avoidance. The reliability of the scale was .82 in Moon's (2006) study and the scale reliability of this study was .83.

Korean Version of the Penn State Worry Questionnaire (K-PSWQ)

To measure the characteristics of worry in general rather than in specific situations, Meyer et al. (1990) developed the scale. In this

study, the K-PSWQ, translated by Kim and Min (1998), was used. The scale is unidimensional and consists of 16 items, with the total score used. Each item was rated on a 5-point Likert scale. Five of these items were reverse-scored. A high total score reflects excessive worry. The reliability of the scale was .92 in Kim and Min (1998) and .92 in the present study.

Data Analysis

Data were analyzed using SPSS 29.0 and AMOS 29.0. First, descriptive statistics were conducted to identify the demographic characteristics of the participants. Second, descriptive statistics and Pearson correlation analysis were used to check the characteristics and normality of the variables and to confirm the relation-

ship between the variables. Third, internal consistency was calculated to verify the reliability of the measurement tools. Fourth, Confirmatory Factor Analysis (CFA) was conducted to examine the factor structure of the latent variables and to assess the model's goodness-of-fit indices. Fifth, structural model analysis was conducted to determine which model was more suitable between the theoretical model and the competing model. Sixth, the path coefficients of the final model were calculated, and the significance of the indirect effects was tested. Seventh, to identify variables associated with a subclinical maladaptive group, participants were classified according to a PSWQ cutoff score of 56, and hierarchical regression analysis was then conducted.

Results

Descriptive statistics, correlations, and normality and multicollinearity testing of the data of the main variables were analyzed and are presented in Table 1. First, descriptive statistics indicated the following: IU ($M = 3.33$, $SD = .64$), perceived control ($M = 2.61$, $SD = .61$), experiential avoidance ($M = 3.91$, $SD = .71$), and pathological worry ($M = 3.27$, $SD = .68$). Next, the correlation analysis showed that the main variables were significantly correlated. Specifically, IU and perceived control were negatively correlated ($r = -.48$, $p < .001$), whereas IU was positively correlated with experiential avoidance ($r = .57$, $p < .001$) and pathological worry ($r = .64$, $p < .001$). Next, perceived control was negatively correlated with

Table 1. Descriptive Statistics, Correlation Analysis, and Normality and Multicollinearity Testing of the Data of the Main Variables ($N = 406$)

	1	2	3	4
1	-			
2	-.48***	-		
3	.57***	-.78***	-	
4	.64***	-.65***	.71***	-
<i>M</i>	3.33	2.61	3.91	3.27
<i>SD</i>	.64	.61	.71	.68
skewness	-.13	-.21	-.13	-.04
kurtosis	.29	1.41	1.35	-.02

1 = IUS; 2 = ACQ; 3 = AAQ; 4 = PSWQ.

*** $p < .001$.

Table 2. Confirmatory Factor Analysis Results of the Measurement Model

Latent Variables	Observed variables	<i>B</i>	<i>S.E.</i>	β	<i>C.R.</i>	<i>AVE</i>	Composite reliability
X1	IUS 1	1.00		.82			
	IUS 2	1.08	.05	.89	20.48***	.85	.94
	IUS 3	1.04	.05	.86	19.72***		
X2	ACQ 1	1.00		.84			
	ACQ 2	1.17	.05	.86	21.58***	.88	.96
	ACQ 3	1.22	.05	.91	23.39***		
M	AAQ 1	1.00		.86			
	AAQ 2	.92	.04	.85	21.27***	.78	.91
	AAQ 3	.78	.04	.78	18.67***		
Y	PSWQ1	1.00		.91			
	PSWQ2	1.05	.04	.92	29.16***	.90	.97
	PSWQ3	1.04	.04	.91	28.89***		

X1 = IUS; X2 = ACQ; M = AAQ; Y = PSWQ.

*** $p < .001$.

experiential avoidance ($r = -.78, p < .001$) and pathological worry ($r = -.65, p < .001$). Finally, experiential avoidance and pathological worry were positively correlated ($r = .71, p < .001$). In this study, the absolute values of skewness (.04–.21) and kurtosis (.02–1.41) were within the criteria. Suggested by Kline (2010), namely skewness (absolute value < 3) and kurtosis (absolute value < 10). Thus, the normality of the data was confirmed. The VIF values (1.48–2.88) and tolerance values (.35–.68) indicated that multicollinearity was not a concern.

The results of testing model fit showed good fit: $\chi^2(df) = 114.73(48)^{***}$, RMR = .02, RMSEA = .06, TLI = .98, CFI = .98, NFI = .97. The results of the confirmatory factor analysis are presented in Table 2. The standardized factor loadings ($\beta = .78-.92$) were significant, supporting the reliability of the measurement model. Convergent validity was also supported, as shown by AVE values (.78–.90) and composite reliability estimates (.91–.97).

As the correlation between perceived control and experiential avoidance was high (–.88), raising the possibility of a jangle fallacy, discriminant validity was examined to determine whether the two constructs measured distinct concepts. The AVE values (.78–.90) exceeded the squared correlations (.29–.77). In addition, because 1 was not included within the confidence intervals bounded by the lower and upper limits, the two constructs were considered to reflect distinct concepts. The results of the discriminant validity test

are presented in Table 3.

To determine the final model, the fit indices of the research model and the competing model were compared, and the results are presented in Table 4. The research model showed a good fit: $\chi^2(df) = 114.73(48)^{***}$, CFI = .98, TLI = .98, NFI = .97, GFI = .96, RMSEA = .06. The competing model also showed a good fit: $\chi^2(df) = 115.85(49)^{***}$, CFI = .98, TLI = .98, NFI = .97, GFI = .96, RMSEA = .06. Both models were confirmed to be well-fitting. To adopt the final model, a chi-square difference test was performed, and the difference was not significant: CSDT [$df = 1$] = 1.12, *n.s.* Therefore, the more parsimonious competing model was retained as the final model.

To check the path coefficients of the final model and test the significance of the indirect effects, path analysis was conducted while controlling for gender. The final model fit test showed a good fit: $\chi^2(df) = 133.76(57)^{***}$, RMR = .02, RMSEA = .06, TLI = .97, CFI = .98, NFI = .97. The path coefficient results of the final model are reported in Table 5 and presented in Figure 1. IU showed significant positive paths to experiential avoidance ($\beta = .25, p < .001$) and pathological worry ($\beta = .32, p < .001$). Perceived control showed a significant negative path to experiential avoidance ($\beta = -.75, p < .001$). Finally, experiential avoidance showed a significant positive path to pathological worry ($\beta = .58, p < .001$).

We examined whether the indirect paths through experiential

Table 3. Discriminant Validity of the Measurement Model

Correlation	Correlation coefficient	Correlation coefficient ²	AVE	S.E.	Lower limit	Upper limit
X1 ↔ X2	-.54***	.29	.85/.88	.02	-.58	-.50
X1 ↔ M	.65***	.42	.85/.78	.03	.59	.71
X1 ↔ Y	.70***	.49	.85/.90	.03	.64	.76
X2 ↔ M	-.88***	.77	.88/.78	.03	-.94	-.82
X2 ↔ Y	-.71***	.50	.88/.90	.02	-.75	-.67
M ↔ Y	.79***	.62	.78/.90	.03	.73	.85

X1 = IUS; X2 = ACQ; M = AAQ; Y = PSWQ.

*** $p < .001$.

Table 4. Comparison of Model Fit Indices

Fit index	χ^2 (df)	Normed χ^2	RMSEA	TLI	CFI	AIC	BIC	ECVI	CAIC
Research Model	114.73 (48)***	2.39	.06	.98	.98	174.73	294.92	.43	324.92
Competing Model	115.85 (49)***	2.36	.06	.98	.98	173.85	290.03	.43	319.03

*** $p < .001$.

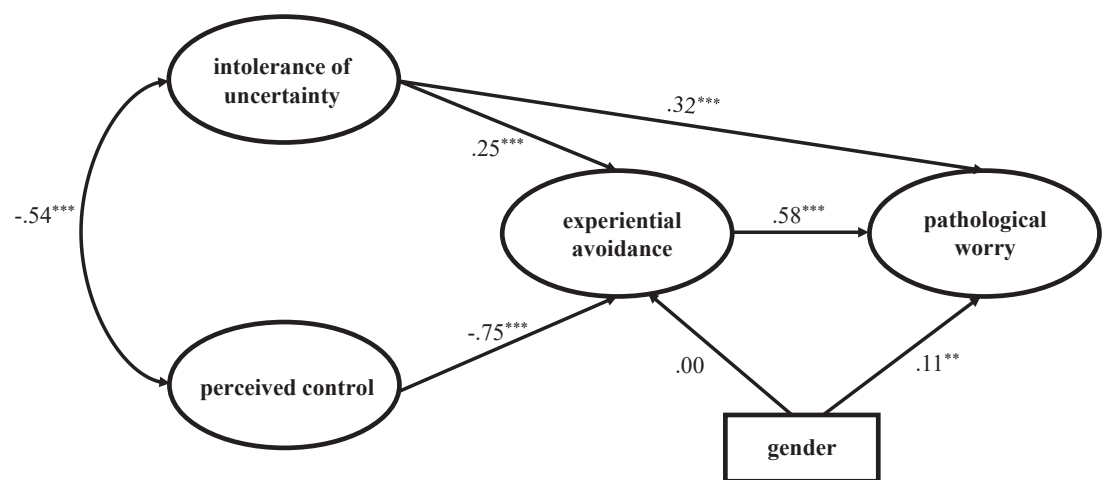


Figure 1. Standardized path coefficients of the final model.

Table 5. Path Coefficients of the Final Model

Independent Variable	Dependent Variable	B	β	S.E.	C.R.
X1	M	.32	.25	.05	5.89***
X2		-1.07	-.75	.07	-14.78***
Gender		.00	.00	.05	.00
X1	Y	.35	.32	.06	6.24***
M		.50	.58	.05	10.91***
Gender		.14	.11	.04	3.27**
X1 ↔ X2		-.16	-.54	.02	-8.23***
X1 ↔ Gender		.02	-	.02	1.03
X2 ↔ Gender		-.04	-	.01	-2.98**

X1 = IUS; X2 = ACQ; M = AAQ; Y = PSWQ.

** $p < .01$, *** $p < .001$.

Table 6. Results of Indirect Effect Significance Testing

Path	Unstandardized coefficient		Standardization coefficient	p	Boot	
	B	Boot SE			LLCI	ULCI
X1 → M → Y	.16	.04	.14	< .001	.09	.23
X2 → M → Y	-.53	.07	-.43	< .001	-.67	-.40

X1 = IUS; X2 = ACQ; M = AAQ; Y = PSWQ.

avoidance were significant in the relations of IU and perceived control with pathological worry. The results are presented in Table 6. First, the indirect effect of IU on pathological worry through experiential avoidance was confirmed to be significant, as the bootstrap confidence interval (.09–.23) did not include zero. The indirect effect of perceived control on pathological worry through experiential avoidance was also confirmed to be significant, as the bootstrap confidence interval (–.67–.40) did not include zero.

In this study, additional analyses were conducted by setting a PSWQ cutoff and selecting the corresponding group so that pathological worry would not remain merely an individual-difference characteristic but could also help identify a subclinical maladaptive group. The cutoff was set in consideration of the claim that a total PSWQ score of 56 or higher corresponds to a level consistent with diagnostic criteria (Mennin et al., 1999; Molina & Borkovec, 1994, as cited in Oh & Chung, 2011), and 146 of the 406 partici-

Table 7. Hierarchical Regression Analysis of Variables Associated with Pathological Worry

Independent variable	Step 1		Step 2		Step 3	
	<i>B</i>	β	<i>B</i>	β	<i>B</i>	β
X2	-.29	-.49***	-.14	-.23*	-.12	-.20*
M	-	-	.21	.38***	.17	.31**
X1	-	-	-	-	.22	.30***
Constant	4.63		3.35		2.64	
ΔR^2	.24		.08		.08	
R^2	.24		.32		.40	
F	46.34***		33.26***		31.16***	

X1 = IUS; X2 = ACQ; M = AAQ.

* $p < .05$, ** $p < .01$, *** $p < .001$.

pants met this criterion. Hierarchical regression analysis was conducted to examine the relative effects of intolerance of uncertainty, perceived control, and experiential avoidance on pathological worry in the group with a total score of 56 or higher. The VIF values (1.12–1.99) and tolerance values (.50–.90) indicated that multicollinearity was not a concern. Perceived control was entered at Step 1, experiential avoidance at Step 2, and intolerance of uncertainty at Step 3, and the results are presented in Table 7.

The Step 1 model was statistically significant ($F = 46.34, p < .001$), with perceived control accounting for 24% of the variance in pathological worry. The Step 2 model was also statistically significant ($F = 33.26, p < .001$) and explained an additional 8% of the variance. The Step 3 model likewise reached statistical significance ($F = 31.16, p < .001$) and accounted for a further 8% of the variance. In the final step of the hierarchical regression, perceived control ($\beta = -.20, p < .05$), experiential avoidance ($\beta = .31, p < .01$), and intolerance of uncertainty ($\beta = .30, p < .001$) emerged as significant correlations of pathological worry. In relative terms, experiential avoidance showed the strongest association with pathological worry, followed by intolerance of uncertainty and perceived control. These findings suggest that experiential avoidance may be more closely tied to pathological worry.

Discussion

First, the competing model fit the data better than the research model. In the supported model, intolerance of uncertainty showed both a direct relation with pathological worry and an indirect relation through experiential avoidance, whereas perceived control

was related to pathological worry only through experiential avoidance. This pattern suggests that experiential avoidance may be more central to pathological worry than perceived control itself. Put differently, pathological worry may be better understood by considering the way lower perceived control is associated with greater experiential avoidance, which in turn is linked to pathological worry. More broadly, the fact that both cognitive vulnerability factors and belief-based factors were indirectly related to pathological worry through experiential avoidance suggests that pathological worry reflects multiple interrelated processes rather than a single linear mechanism.

Second, experiential avoidance was found to partially mediate the relationship between intolerance of uncertainty and pathological worry. These findings suggest that both intolerance of uncertainty and experiential avoidance may be important factors in the development and maintenance of pathological worry and are consistent with prior findings indicating that experiential avoidance partly accounts for the relation between intolerance of uncertainty and pathological worry (Yang & Park, 2014). The significant direct path from intolerance of uncertainty to pathological worry suggests that intolerance of uncertainty may represent a cognitive vulnerability factor in accounts of GAD. At the same time, as this vulnerability was also indirectly related to pathological worry through experiential avoidance, the present findings suggest that interventions for pathological worry may need to take both experiential avoidance and intolerance of uncertainty into consideration.

These individuals may repeatedly engage in excessive and difficult-to-control worry about matters that may potentially be perceived as problematic, based on the belief that uncertainty is diffi-

cult to tolerate (Freeston et al., 1994). Alternatively, they may try to temporarily relieve tension by avoiding unpleasant private experiences arising from the belief that they are unable to cope effectively with uncertainty. However, avoidant coping can deprive individuals of the opportunity to learn that uncertainty may, in fact, carry little actual risk (Roemer & Orsillo, 2002). Consequently, the negative emotional experiences triggered by uncertainty remain unresolved, and individuals may sustain worry as an effort to dull these experiences (Mennin et al., 2002).

Third, the relationship between perceived control and pathological worry was fully mediated by experiential avoidance. Because the effect of experiential avoidance on pathological worry is greater than that of perceived control, the direct effect of perceived control on pathological worry may no longer be significant once experiential avoidance is included. These findings are partly consistent with prior research showing that perceived control was not directly related to social anxiety (Seo, 2017), and they support earlier work highlighting the need to target experiential avoidance in interventions for GAD (Roemer & Orsillo, 2002, 2005).

These findings are also consistent with the view that avoidance of threat-related stimuli may restrict opportunities for new learning and thereby contribute to the persistence of fear (Mowrer, 1960, as cited in Roemer & Orsillo, 2002). Accordingly, in GAD interventions, it may be important to consider not only approaches that enhance perceived control but also those that reduce experiential avoidance.

The evaluation of coping strategies and personal resources can be important in dealing with situations individuals face (Smith & Lazarus, 1990). When individuals employ adaptive coping strategies, it is likely that they have actively evaluated their own abilities for problem solving. In contrast, maladaptive coping strategies may reflect a passive evaluation of one's problem-solving ability (Smith & Lazarus, 1990). Therefore, when individuals perceive uncertain situations as threatening and evaluate their coping ability as low, they may deal with such situations through avoidance. Such avoidant coping may persist because it temporarily alleviates physiological arousal (Borkovec, 1994). However, as avoidance behaviors increase, anxiety may rise temporarily (Flores et al., 2018), ultimately heightening pathological worry symptoms, as suggested by the present findings.

Additionally, These results indicate that experiential avoidance is an important factor to predict pathological worry. Thus, it can be suggested that addressing experiential avoidance may be important in addressing pathological worry symptoms. Until now, GAD research has been dominated by treatment techniques that target cognitive avoidance. In contrast, insufficient research has examined emotional and behavioral avoidance (Roemer & Orsillo, 2002). Therefore, based on the present findings, Acceptance-Based Behavioral Therapy for Generalized Anxiety Disorder (ABBT; Roemer & Orsillo, 2005) may be a promising approach. This approach targets avoidant coping strategies and helps individuals accept their internal experiences, ultimately aiming to reduce GAD symptoms (Roemer & Orsillo, 2005).

The present study is meaningful in that it examined the mediating role of experiential avoidance in the relations of IU and perceived control with pathological worry. In doing so, it extends the IUM, which has primarily guided intervention from a cognitive perspective, by highlighting the importance of experiential avoidance and thereby providing a basis for a more integrated understanding of the IUM and ABM. In other words, the present findings suggest that interventions may need to take into account both intolerance of uncertainty as a cognitive vulnerability factor and experiential avoidance as an avoidant coping style. At the same time, rather than focusing exclusively on perceived control in interventions for pathological worry, it may be important to consider approaches that address both perceived control and experiential avoidance.

Limitations of this study are as follows. First, as the present study was based on individual-difference correlations and a cross-sectional design, it is limited in its ability to clarify the temporal ordering of the variables, and causal interpretations should therefore be made with caution. In addition, it is difficult to rule out the possibility of third variables beyond the paths examined in the present study (e.g., general negative affectivity and a tendency toward cognitive confusion), as well as reverse-direction associations in which experiential avoidance is related to intolerance of uncertainty and perceived control. Accordingly, future research would benefit from adopting designs that can clarify the temporal ordering of the variables and from specifying models that take into account potential third variables and reverse-direction possi-

bilities. Second, since the data were collected from the general population, caution is needed in generalizing the findings to clinical groups. Thus, future research should include groups diagnosed with generalized anxiety disorder or apply related clinical measures. Third, the present study relied on self-report questionnaires to assess the main variables. As such, the findings may reflect participants' subjective perceptions. Fourth, prior research has suggested gender differences in the pathways related to pathological worry (Seol & Oh, 2008). Therefore, examining pathological worry processes separately by gender may help inform the development of gender-specific interventions.

Acknowledgements

The authors would like to thank Macromill Embrain for their assistance with data collection. We also thank ENAGO CO KR for providing translation services.

Author contributions statement

H. Hong: Conceptualization, Data curation, Data Analysis, Writing, Review.

B. Choi: Professor, Department of Education, Graduate School of Education, Jeju National University, Jeju, Republic of Korea, Supervision.

References

- American Psychological Association. (2003). Diagnostic and statistical manual of mental disorders (4th ed., text rev.).
- American Psychological Association. (2013). Diagnostic and statistical manual of mental disorders: DSM-5 (5th ed.).
- Behar, E., DiMarco, I. D., Hekler, E. B., Mohlman, J., & Staples, A. M. (2009). Current theoretical models of generalized anxiety disorder (GAD): Conceptual review and treatment implications. *Journal of Anxiety Disorders*, 23, 1011–1023. <https://doi.org/10.1016/j.janxdis.2009.07.006>
- Borkovec, T. D. (1994). The nature, functions, and origins of worry. In G. Davey & F. Tallis (Eds.), *Worrying: Perspectives on theory, assessment, and treatment* (pp. 5–33). Wiley.
- Brown, T. A., Di Nardo, P. A., Lehman, C. L., & Campbell, L. A. (2001). Reliability of DSM-IV anxiety and mood disorders: Implications for the classification of emotional disorders. *Journal of Abnormal Psychology*, 110, 49–58. <https://doi.org/10.1037/0021-843X.110.1.49>
- Buhr, K., & Dugas, M. J. (2002). The intolerance of uncertainty scale: Psychometric properties of the English version. *Behaviour Research and Therapy*, 40, 931–945. [https://doi.org/10.1016/S0005-7967\(01\)00092-4](https://doi.org/10.1016/S0005-7967(01)00092-4)
- Carleton, R. N., Norton, M. A., & Asmundson, G. J. G. (2007). Fearing the unknown: A short version of the intolerance of uncertainty scale. *Journal of Anxiety Disorders*, 21, 105–117. <https://doi.org/10.1016/j.janxdis.2006.03.014>
- Cho, S. Y., & Jo, H. I. (2014). The effects of intolerance of uncertainty and perceived control on worry: The mediating effects of negative problem orientation. *Korean Journal of Counseling*, 15, 1647–1669. <https://doi.org/10.15703/kjc.15.5.201410.1647>
- Chorpita, B. F., & Barlow, D. H. (1998). The development of anxiety: The role of control in the early environment. *Psychological Bulletin*, 124, 3–21. <https://doi.org/10.1037/0033-2909.124.1.3>
- Dugas, M. J., Gagnon, F., Ladouceur, R., & Freeston, M. H. (1998). Generalized anxiety disorder: A preliminary test of a conceptual model. *Behaviour Research and Therapy*, 36, 215–226. [https://doi.org/10.1016/S0005-7967\(97\)00070-3](https://doi.org/10.1016/S0005-7967(97)00070-3)
- Dugas, M. J., Marchand, A., & Ladouceur, R. (2005). Further validation of a cognitive-behavioral model of generalized anxiety disorder: Diagnostic and symptom specificity. *Journal of Anxiety Disorders*, 19, 329–343. <https://doi.org/10.1016/j.janxdis.2004.02.002>
- Flammer, A. (1995). Developmental analysis of control beliefs. In A. Bandura (Ed.), *Self-efficacy in changing societies* (pp. 69–113). Cambridge University Press.
- Flores, A., López, F. J., Vervliet, B., & Cobos, P. L. (2018). Intolerance of uncertainty as a vulnerability factor for excessive and inflexible avoidance behavior. *Behaviour Research and Therapy*, 104, 34–43. <https://doi.org/10.1016/j.brat.2018.02.008>
- Freeston, M. H., Rhéaume, J., Letarte, H., Dugas, M. J., & Ladouceur, R. (1994). Why do people worry? *Personality and Individual Differences*, 17, 791–802. [https://doi.org/10.1016/0191-8869\(94\)90048-5](https://doi.org/10.1016/0191-8869(94)90048-5)
- Gerdan, G., & Salcioglu, E. (2025). Experiential avoidance as a transdiagnostic mediator in the relationship between intolerance of uncertainty, maladaptive perfectionism, and psychiatric symptoms: Structural and causal mediation analyses in a clinical sample. *Clinical Psychology & Psychotherapy*, 32, 1–12. <https://doi.org/10.1002/cpp.70102>
- Gvozden, T. V., Baucal, A., Krstić, K., & Filipović, S. (2021). Intolerance of uncertainty and tendency to worry as mediators between trust in institutions and social support and fear of coronavirus and consequences of the pandemic. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.737188>
- Hayes, S. C., Strosahl, K., Wilson, K. G., Bissett, R. T., Pistorello, J., Toarmino, D., Polusny, M. A., Dykstra, T. A., Batten, S. V., Ber-

- gan, J., Stewart, S. H., Zvolensky, M. J., Eifert, G. H., Bond, F. W., Forsyth, J. P., Karekla, M., & McCurry, S. M. (2004). Measuring experiential avoidance: A preliminary test of a working model. *The Psychological Record*, 54, 553–578. <https://doi.org/10.1007/BF03395492>
- Hayes, S. C., Wilson, K. G., Gifford, E. V., Follette, V. M., & Strosahl, K. (1996). Experimental avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*, 64, 1152–1168. <https://doi.org/10.1037/0022-006X.64.6.1152>
- Kim, J. H., & Hyun, M. H. (2011). The effects of intolerance of uncertainty and perceived control on worry: The mediating effects of cognitive avoidance. *Korean Journal of Psychology: General*, 30, 1149–1164.
- Kim, J. W., & Min, B. B. (1998). Intolerance of uncertainty and problem orientation in worry. *Korean Psychological Association Annual Conference*, 1, 83–92.
- Kline, R. B. (2010). *Principles and practice of structural equation modeling* (3rd ed.). Guilford Press.
- Ladouceur, R., Blais, F., Freeston, M. H., & Dugas, M. J. (1998). Problem solving and problem orientation in generalized anxiety disorder. *Journal of Anxiety Disorders*, 12, 139–152. [https://doi.org/10.1016/S0887-6185\(98\)00002-4](https://doi.org/10.1016/S0887-6185(98)00002-4)
- Ladouceur, R., Dugas, M. J., Freeston, M. H., Rhéaume, J., Blais, F., Boisvert, J. M., Gagnon, F., & Thibodeau, N. (1999). Specificity of generalized anxiety disorder symptoms and processes. *Behavior Therapy*, 30, 191–207. [https://doi.org/10.1016/S0005-7894\(99\)80003-3](https://doi.org/10.1016/S0005-7894(99)80003-3)
- Lee, S., Hyun, M. H., & Shin, J. (2023). Validating a short version of the intolerance of uncertainty scale-12 (IUS-12). *Stress Research*, 31, 97–105. <https://doi.org/10.17547/kjsr.2023.31.3.97>
- Mennin, D. S., Heimberg, R. G., Turk, C. L., & Fresco, D. M. (2002). Applying an emotion regulation framework to integrative approaches to generalized anxiety disorder. *Clinical Psychology: Science and Practice*, 9, 85–90. <https://doi.org/10.1093/clippsy.9.1.85>
- Meyer, T. J., Miller, M. L., Metzger, R. L., & Borkovec, T. D. (1990). Development and validation of the Penn State worry questionnaire. *Behaviour Research and Therapy*, 28, 487–495. [https://doi.org/10.1016/0005-7967\(90\)90135-6](https://doi.org/10.1016/0005-7967(90)90135-6)
- Moon, H. M. (2006). Development and validation of the program for facilitation of psychological acceptance based on acceptance & commitment therapy model (Doctoral dissertation, The Catholic University of Korea).
- Nam, H. J., & Lee, H. J. (2005). The impact of perceived control on depression and life satisfaction of elderly women. *Korean Journal of Gerontological Social Welfare*, 27, 255–277.
- Oh, Y., & Chung, N. (2011). The relationship between intolerance of uncertainty and worry: Testing the mediating effect of experiential avoidance. *Korean Journal of Counseling and Psychotherapy*, 23, 671–691.
- Oh, Y., & Oh, K. S. (2009). Confirmatory factor analysis of the revised Korean version of the anxiety control questionnaire: Testing configural and metric invariance across clinical and non-clinical samples. *Korean Journal of Clinical Psychology*, 28, 995–1010. <https://doi.org/10.15842/kjcp.2009.28.4.003>
- Rapee, R. M. (1985). Distinctions between panic disorder and generalized anxiety disorder: Clinical presentation. *Australian and New Zealand Journal of Psychiatry*, 19, 227–232. <https://doi.org/10.3109/00048678509158827>
- Rapee, R. M. (1991). Generalized anxiety disorder: A review of clinical features and theoretical concepts. *Clinical Psychology Review*, 11, 419–440. [https://doi.org/10.1016/0272-7358\(91\)90116-C](https://doi.org/10.1016/0272-7358(91)90116-C)
- Rapee, R. M., Craske, M. G., Brown, T. A., & Barlow, D. H. (1996). Measurement of perceived control over anxiety-related events. *Behaviour Therapy*, 27, 279–293. [https://doi.org/10.1016/S0005-7894\(96\)80018-9](https://doi.org/10.1016/S0005-7894(96)80018-9)
- Roemer, L., & Orsillo, S. M. (2002). Expanding our conceptualization of and treatment for generalized anxiety disorder: Integrating mindfulness/acceptance-based approaches with existing cognitive-behavioral models. *Clinical Psychology: Science and Practice*, 9, 54–68. <https://doi.org/10.1093/clippsy.9.1.54>
- Roemer, L., & Orsillo, S. M. (2005). An acceptance-based behavior therapy for generalized anxiety disorder. In S. M. Orsillo & L. Roemer (Eds.), *Acceptance and mindfulness-based approaches to anxiety: Conceptualization and treatment* (pp. 213–240). Springer.
- Seo, E. B. (2017). The relationship between internalized shame and social anxiety: The mediating effect of perceived control and experiential avoidance (Master's thesis, The Catholic University of Korea).
- Seol, S. W., & Oh, K. J. (2008). The mechanism of the influence of intolerance of uncertainty and perceived emotion controllability on worry: Mediating effect of problem orientation. *Korean Journal of Clinical Psychology*, 27, 209–235. <https://doi.org/10.15842/kjcp.2008.27.1.013>
- Shin, D., & Kim, E. (2021). The relationships among anxiety sensitivity, intolerance of uncertainty, and worry symptoms. *Humanities and Social Sciences* 21, 12, 2455–2470.
- Smith, C. A., & Lazarus, R. S. (1990). Emotion and adaptation. In L. A. Pervin (Ed.), *Handbook of personality: Theory and research* (pp. 609–637). Guilford Press.
- Turk, C. L., & Wolanin, A. T. (2006). Assessment of generalized anxiety disorder. In G. C. L. Davey & A. Wells (Eds.), *Worry and its psychological disorders: Theory, assessment and treatment* (pp. 137–155). Wiley.
- Wallston, K. A., Wallston, B. S., Smith, S., & Dobbins, C. J. (1987). Perceived control and health. *Current Psychological Research &*

- Reviews*, 6, 5–25. <https://doi.org/10.1007/BF02686633>
- Wittchen, H. U., Zhao, S., Kessler, R. C., & Eaton, W. W. (1994). DSM-III-R generalized anxiety disorder in the National Comorbidity Survey. *Archives of General Psychiatry*, 51, 355–364. <https://doi.org/10.1001/archpsyc.1994.03950050015002>
- Yang, K. E., & Park, K. H. (2014). The effects of intolerance for uncertainty and emotional dysregulation on worrying: Mediating effect of experiential avoidance. *Korean Journal of Health Psychology*, 19, 187–201. <https://doi.org/10.17315/kjhp.2014.19.1.010>